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EDWARDS' ISOCHROMATIC PLATES.

THE OPTICAL MAGIC LANTERN JOURNAL AND PHOTOGRAPHIC ENLARGER.

A Magazine of Popular Science for the Lecture-room and the Domestic Circle.

Edited by J. HAY TAYLOR.

[Entered at Stationers' Hall.]

Vol. 2.—No. 25. JUNE 1, 1891. Price One Penny.

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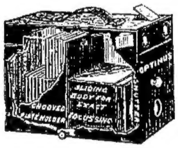

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6 in., no ,,	133 0	6 in., no ,, ...	87 6
6 in., with ,,	151 0	6 in., and ,, ...	115 3
7 in., no ,,	155 0	7 in., no ,, ...	110 0
7 in., with ,,	173 6	7 in., and ,, ...	137 9
8 in., ,, ,,	256 0	8 in., no ,, ...	160 0
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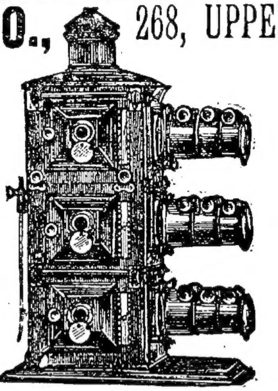

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THE OPTICAL
MAGIC LANTERN
JOURNAL
AND
PHOTOGRAPHIC ENLARGER.

EDITED BY J. HAY TAYLOR.

Vol. 2.—No. 25. [Entered at Stationers' Hall.] JUNE 1, 1891. Price One Penny.

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Notices.

THE *Optical Magic Lantern Journal and Photographic Enlarger* is issued on the 1st of every month, price One Penny, and may be obtained from all Newsvendors, Railway News Stalls, Photographic Dealers, or from the Publishers, at the following rates, post free :—

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Editorial communications must be addressed, The Editor; advertisements and business communications to Taylor Brothers, care of the Publishers, Dorset Works, Salisbury Square, Fleet Street, London, E.C.

American Agents :—The International News Co., 83 and 85, Duane Street, New York City.

Notes.

INSTEAD of commencing a new volume with this issue, it has been decided to continue Vol. II. until December, so as to begin each volume in future on January 1. Those desiring to complete their back numbers are reminded that No. 1 is out of print, but a few copies of Nos. 2 and 3 have been obtained and may be had at one shilling each.

* * *

MR. WM. GOODWIN, hon. sec. for the Glasgow International Photographic Exhibition (September 1 to October 3, 1891), will be glad to hear from those who would be willing to lend sets of lantern slides, with readings. Mr. Goodwin's address is 3, Lynedoch-street, Glasgow. As it is intended to make a special feature of lantern exhibitions, a large number of sets of slides will be required.

* * *

IN future, the reports of the Society of Amateur Photographers of New York will be published in the *Photo-American Review*, a new monthly (twenty-five cents.) We have received the first number, which contains thirty-eight photographic reproductions from negatives by members of this society. Those wishing to possess a collection of pictures of the highest class, should send to the publisher, H. C. Jones, 92-94, Fifth Avenue, New York, U.S.A.

* * *

THE Adrian Camera Club, U.S.A., have lately had a new electric lantern built. It is found to be vastly superior to the limelight, and the cost is only about two shillings an evening.

* * *

PROFESSOR MUYBRIDGE is giving a series of lectures in Germany on animal locomotion, and illustrating them with the zoopraxiscope. He has had some very distinguished audiences.

* * *

THE continuation of "An Illuminated Fountain and How to Use It," has had to be omitted from this issue, as Mr. Dormer is perfecting his mode of illumination.

The United Kingdom Band of Hope Union is about to publish a new set of sixty slides and lecture "Thirty Years with South Sea Cannibals," the experience of the Rev. J. G. Paton, D.D. The designs, which have been drawn by Mr. F. Weeks, of 14, Thorpe-road, Forest Gate, are also to be reproduced to illustrate Dr. Paton's book upon this subject.

* * *

We learn that Mr. W. C. Hughes, of Kingsland, is preparing to introduce some novel compact lanterns and fittings for the coming season. We hope to hear more of this in a short time.

* * *

Arrangements have been made by the Cardiff Photo Society with the committee of the Glasgow Exhibition by which exhibitors desirous of competing at both exhibitions may have their pictures sent from Cardiff to arrive at Glasgow in time for the judging on August 31.

* * *

The new premises of Mr. Walter Tyler, in Waterloo-road, were opened about a week ago; the two shops 48 and 50 have been renovated and are now of such a nature that they can vie favourably with many Regent-street establishments.

* * *

The "housewarming" at the new premises of the Camera Club was held on the 25th ult., and assumed the form of a concert and soirée. A large number of members and their friends were present, and spent a most enjoyable evening. The following is a synopsis of the programme :—

Music : Concert in club-room.
Lantern exhibition in club-room.
Exhibition of photographs by members.
Exhibition of mechanical work by members in the lathe room.
The Phonograph in the library.
Microscopes, stereoscopes, the thaumatrope.
Chladni's sound figures and Newton's coloured discs, &c.
Exhibition of sleight of hand by Mr. F. R. Broadbridge.

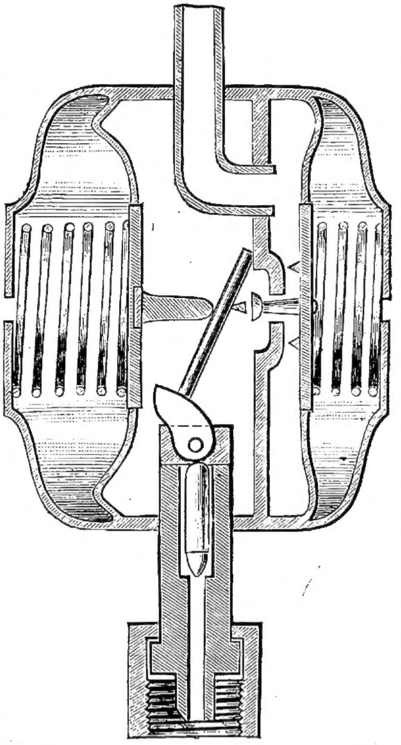
——:o:——

Inside a Regulator.

No. 1.

We all know that a regulator is attached to a bottle of compressed gas for the purpose of keeping the egress of gas under control, and allowing it to reach the jet in such quantities as may be required. The external form of a governor or regulator is a familiar one, but the interior which is said by many to contain "some peculiar kind of valve" is not so well known, so we will take a peep inside and find out in what manner the mechanism is affected.

As there are several forms of regulators upon the market we shall give sketches of a few of the leading styles.



Duplex.—The screw end at the lower portion is for connecting the regulator to the gas bottle. Let us suppose that the outlet tube at top is, for the moment closed, and see what takes place when the gas from the cylinder is permitted to enter. The spring at the left-hand side presses upon a disc attached to a circular piece of india rubber ; secured to this disc is a projection containing a hole which carries a rod back and forward as it is moved. This rod, which is fastened to a cam-shaped piece, in turn operates the valve. In its normal state the relative positions of the parts are as shown in the cut, but as soon as the pressure of the gas from the bottle is permitted to enter, the spring at the right-hand side (it being the weaker of the two) is first depressed, the valve fastened to the disc of which causes the compartment on the right to shut, enclosing a certain quantity of the gas. The pressure then causes the left-hand spring to compress ; this pulls the lever over with it, and causes the cam on the end of it to press upon the end of the bullet-shaped valve to move, and closes all connection between the regulator and the bottle. As soon as the outlet pipe on top is opened, the weak spring on the right gently forces out the gas in that compartment, but no sooner does this commence than a supply from the left-hand compartment refills it. A part of the pressure from the compartment on the left has thus been taken off, the force of the spring pushes the lever forward, which allows the bullet valve to open slightly, thus permitting a

Prize Medals, Liverpool International Exhibition, 1886.
Photographic Exhibition, 1888.

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Proved superior to all others. See reports.

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All kinds of Slides made to Order.

Dissolving View Magic Lanterns and Slides.

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Gentlemen wishing to include property in these Sales, are requested to send particulars one week prior to Sale.

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TRI-UNIAL LANTERN, by E. G. WOOD—with mahogany body and three brass fronts, stages, &c., and threedraw Telescopic fronts, drawing out to focus a 20-inch Lens, 3 sets of Achromatic Lenses, improved Mechanical Adjusting Jets, and three superior four way Dissolving and connecting pieces, so that any or all three lights can be on at once. In case, complete with drawers for apparatus and raising top, of extra strong make. Cost £52—price £30. Lenses and performance guaranteed.

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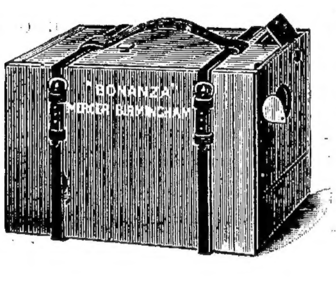

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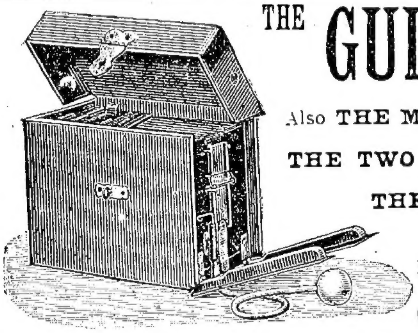

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Gives instantaneous pictures eminently adapted for the Optical Lantern, Book Illustrations, or Sketches for the Artist; and is now in great demand by Tourists, Artists, Special Correspondents, and Missionaries. It differs from all others in its compactness, but is invaluable in this special feature, that when its contents of one dozen plates have been exposed the reservoir containing them may be removed **IN OPEN DAYLIGHT**, and a second, third, or fourth reservoir, each containing twelve or more plates, may be inserted in succession, no dark tent for changing plates being now necessary.

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If reservoir is made detachable, 10s. each instrument extra. Additional reservoirs fitted—Lantern size, £2 5s.; Quarter Plate, £2 10s.

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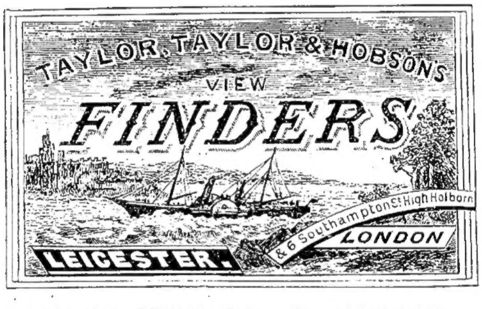

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further supply of gas to enter from the bottle. This double pumping action goes on, thus maintaining an even outlet pressure until the pressure in the bottle is reduced to $\frac{1}{3}$ of an atmosphere.

——:o:——

Hand-Cameras for Obtaining Slides for the Lantern.

	"Facile"	(Fallowfield)	see	March 1st, 1890.
No. 1	"Giah"	(Mawson & Son)	,,	May 1st, ,,
,, 2	"Quadrant" ...	(W. H. Humphries & Co.)	,,	June 1st, ,,
,, 3	"Eclipse ...	(J. F. Shew & Co.)... ...	,,	July 1st, ,,
,, 4	"Eureka" ...	(W. W. Rouch & Co.) ...	,,	Aug. 1st, ,,
,, 5	"Key"	(Platinotype Co.)	,,	Sept. 1st, ,,
,, 6	"Optimus" ...	(Perken, Son & Rayment)	,,	Oct. 1st, ,,
,, 7	"The Griffin"	(Griffin & Sons, Limited)	,,	Nov. 1st, ,,
,, 8	"The Swinden-Earp" Patent	... ...	,,	Dec. 1st, ,,
,, 9	"Collins"	(C. G. Collins) ...	,,	Feb. 1st, 1891.
,, 10	"Kodak" ...	(Eastman Co.)	,,	Mar. 1st, ,,
,, 11	"Guinea" ...	(Walter Griffith)	,,	April 1st, ,,
,, 12	"Vanneck" ...	(Watson & Sons)	,,	May 1st, ,,

No. 13.—"CHADWICK'S."

Mr. J. W. Chadwick, of Manchester, has certain practical ideas of his own as to what a hand-camera should do, and he has arranged the camera bearing his name in accordance with his ideas.

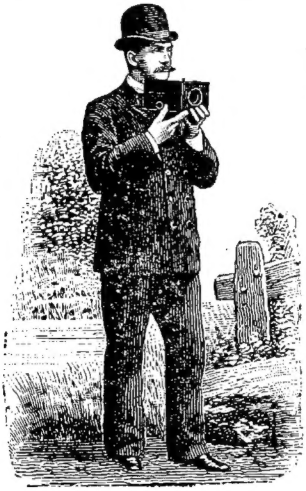

Fig. 1.

It is for quarter plates, is light and compact, and is intended for taking pictures from about the same height as the view is seen in Nature, and for this reason it is held close under the chin as in Fig. 1. In order to ascertain the angle of view, three small pins are arranged on the top of the camera front (Fig. 2). By sighting along the pins, first with the right eye and then with the left, this is at once ascertained.

In point of size, the camera is about the same as that of a cigar box. The division containing the lens is capable of being racked in or out for focussing. The milled head by which this is done is of a decided novel style. It is provided with a heart-shaped aperture which forms a pointer, which travels round a circular ivory disc, upon this may be marked the various distances to suit the lens in use.

As a ground glass is supplied with the camera, it is recommended that each user prepare his own scale as follows:—"First pin a newspaper on a wall and walk away about three strides, put in diaphragm, and by means of the focussing button adjust the focus —*i.e.*, make the printing of the newspaper sharp on the ground-glass, and mark the index with a straight line in black ink. Call this No. 1 Register, and associate it with the nearest distance one would ever wish to use; next focus something on the opposite side of the road, and mark the index again, this time with red ink. Call this No. 2, associating it with the distance across an average street. Now take some more distant object, say in the garden if you like, and mark the index once more, this time with black ink again; this is our No. 3 Register, and these three marks are all that will be required."

The shutter, which is of the Kershaw pattern, works in front of the lens, and is attached to a hinged front; when time exposures are required, this front is left open (Fig. 3), and when the camera is mounted upon a light stand, the exposure can then be given in the ordinary manner by a cap.

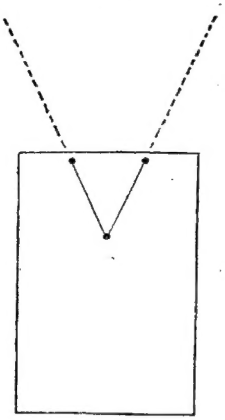

Fig. 2

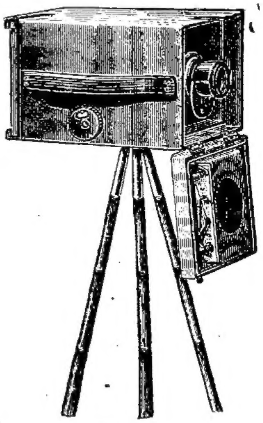

Fig. 3

The sensitive plates are contained in Barnett's Patent Plate holders (an American invention). These holders contain one plate each, and being made of compressed cardboard are very rigid, whilst possessing the property of lightness. As they are very thin, several can be carried without inconvenience in one's pocket.

Six of these carriers are included with each outfit.

——:o:——

Experiences in India with the Ether-Oxygen Light.

By Col. T. Deane (Simla).

Mr. C. Goodwin Norton has (in the journal for March) recorded some useful facts regarding the safety and utility of the ether-oxygen light.

My experiences with this light are precisely similar to his. I have used the best apparatus that can be secured, and find the light most unreliable. On several occasions it has answered perfectly, and on others, without any apparent reason, and with the adoption of all the precautions referred to by Mr. Norton, explosions have occurred which are sufficient to deter anyone from using it with any degree of confidence at a public exhibition.

Mr. Ives, who is, I believe, the inventor of the saturator, recommends the use of benzoline instead of ether. This I have also tried, but with less favourable results. I am now about to try Mr. Scott's Warm Air Saturator, but must confess that past experience has given me but little confidence in the utility of any of these appliances whether they be used with cylinders or gas bags.

This light is referred to by one authority, who, whilst admiring its brilliancy, considers that the time has not yet arrived when it can be used with safety. This opinion coincides with that recorded by Mr. Norton, and also with my own.

I have made this oxygen etho-limelight a special study, and much regret its failure, for in India, when it is impossible to secure coal gas in many stations, the saturator would be invaluable to those who use limelight lanterns. I have found that in dissolving it is more unreliable than when used with the single lantern. I have also found that explosions are less liable to occur with the gas bag than when the oxygen is used from a cylinder. The increased pressure from the latter, however, gives a far more powerful light.

When the weather is warm, with a temperature from 70 deg. to 80 deg., the ether saturator works better than in the cold season. It may be possible, therefore, that Mr. Scott's Warm Air Saturator solves the difficulty, and that ether or benzoline, or a mixture of both, may vaporise better at a high temperature, but even then it is not quite clear whether it can be used safely for dissolving purposes.

Mr. Norton suggests that those who require a better light than is given by the blow-through jet, should use two bags, or two cylinders, whichever suits best. Oxygen cylinders can be imported to India, but hydrogen cylinders cannot, because the gas is explosive. Coal gas is difficult to obtain, and the manufacture of hydrogen gas from dilute sulphuric acid is a troublesome business. The ether saturator, therefore, is the best for this country, and if any of our readers can explain a method by which the saturator can be used with safety it would be a boon. Failing this information, I should be glad to know what is the latest and best kind of electric optical lanterns in the market and their cost. Electric lighting is used here and it is easier to get accumulators charged than to obtain coal gas.

——:o:——

Experiences with Scott's Warm Air Saturator.

By Horace Hilton.

I was led to give this saturator a trial, because I sometimes required a limelight in country districts or where there was no house gas available to work my blow-through jets. I did not feel inclined to be bothered with the additional trouble pertaining to an extra hydrogen cylinder and fittings, neither did I desire that my working expenses should be increased, and as I had in vain endeavoured to improve the light-giving properties of the old-fashioned spirit jet (though I succeeded in perfecting a jet without its disadvantages), I was compelled therefore to try an ether saturator, though, I confess, most reluctantly. When I hinted my decision to my confrères in Brighton, they shook their heads sadly and suggested *that it was a pity that I was going to put my friends to the expense of mourning.* I had for some time resolved that Scott's pattern was the one for me, because—apart from the advantages of the warm air arrangement—there were other things about it that seemed great improvements—viz., filling the saturator at the bottom, and having all taps, unions and T-pieces at the top. I did not when sending to the patentee forward a jet to be corrected, for I wished to try the ether light with an old jet that I already had. I did not expect very brilliant results at first, and neither did I obtain them—in fact my trials were most unsatisfactory. I had numerous pops and bangs, and as for regulating the light at the jet taps, I never reached that stage. But I was determined not to throw over a possibly good thing without giving it a fair trial, so I forwarded the same jet to Mr. Scott, who adapts one free to every purchaser of a saturator direct from him, and in a few days it was returned.

Its appearance then with the curly lateral attachment was rather singular, but the marvellous difference it had made to the jet when I soon afterwards worked it was more singular still. When the fifteen minutes' "warming up" had elapsed, I set to work thoroughly resolved that the time had arrived when in my estimation the saturator must stand or fall. It stood! And it stands high still!

I soon succeeded in obtaining a light that satisfied me in every way, and I also found that it was very easily regulated. Finding that the management of the light was so simple, I next proceeded to test the saturator in every way, in order to cause pops or explosions. I turned off the taps in the wrong order, turned the jet taps up and down rather quickly, turned off the cylinder valve, turned off the inlet tap, and for more than an hour and a-half I failed to cause anything more to accrue from my pranks than a slight pop now and then, not at all alarming, and hardly worth noticing. But this I noticed: so long as I followed instructions—which do not exceed more than half-a-dozen lines—everything worked beautifully. After such a trial as I gave my saturator, it is needless to say that I pronounced it a complete success. I have used the saturator several times since, and never once has the light gone out, popped, or been at all troublesome.

I have worked it with benzoline, ether, and a mixture of both, and the result with a cylinder and regulator has always been satisfactory. In turning out, directly I have turned off vapour tap, I turn round lime, so that the incandescent surface is away from nipple, and I leave on oxygen for a few seconds before turning off. I have only measured quantity of oxygen used once, and on that occasion I used the saturator for one and a-half hours, with a consumption of 6ft. of gas, and 2oz. of ether, total cost being one shilling and sevenpence, including night-lights. I charge saturator before leaving home, and therefore I run no risk of breaking bottles and spilling liquids.

I have a folding bracket that I attach instantaneously to back of lantern box, and this I find to be preferable to hanging the saturator by a chain. I have not yet experimented with a pair of jets for dissolving views, but I intend having a turn at it some day. I believe that my experience is similar to that of many others using the same apparatus, and therefore I am justified in recommending Scott's Warm-Air Saturator to anyone requiring a first-class light occasionally in districts and places where house gas is unobtainable.

The Optics of the Lantern.*

By J. Traill Taylor.

I shall assume the existence of the light which, for the sake of simplicity, may be that emitted from incandescent lime. Now, as its rays radiate in every direction, the first consideration is the collecting as many of these as possible, and causing them to travel in just the direction we desire. If only a few of them, in other words, a narrow angle of illumination, be our requirement, the problem of their forward transmission is one of extreme simplicity; but if, on the other hand, the greatest possible angle of illumination be the desideratum (and of course this is the case), then does the problem become slightly more involved. We cannot here institute a comparison between the methods adopted by lighthouse engineers in utilising all their light and those demanded by the lantern, for in the latter case it is to be employed in the formation of an optical image, whereas in the former it is merely projected into space, and both direct light from a radiant, together with that reflected from either a holophotal or a parabolic reflector, are available. But while we cannot utilise so much of the light as in the lighthouse, we can use it to much greater advantage for our special purpose.

We now inquire the greatest angle of light possible to be got advantageously through a condensing system, for this lies at the root of the whole matter, and in doing so have to ascertain how near can the light be approximated to the first surface with safety. From innumerable trials with lenses of a thickness not too great and set with such a degree of looseness in the brass work as not to be cell-bound, I find that two inches may be considered as quite safe. When condensers crack it is usually the result of their being too tightly burnished in their cells, brought too suddenly under the influence of the heat of the radiant, or being subjected to currents of cold air. I assume, of course, the perfect annealing of the glass of which they are formed. When this last point is dubious, it may be well to adopt the system employed by the Scotchwomen of a former period, who, when laying in a supply of tumblers intended for whisky toddy, invariably placed them in cold water, which was slowly brought to a boil, and then allowed to cool slowly, by which treatment immunity from subsequent breakage was believed to be ensured.

At this stage we proceed to analyse the functions of a lantern condenser—so-called. We find that these are (1st) the collecting, and (2nd) the condensing of the light. Of these the former is much the more important. What we wish done is the collection of so many rays as to form a large angle, and their projection forward in as near an approach to parallelism as possible. Absolute parallelism cannot be obtained unless the flame were a point, instead of being as it is, a disc or patch having sensible dimensions of, say, quarter of an inch upwards.

Some of the cheap French condensers (of which I would not speak disparagingly, for they render excellent service and are marvels at their price) transmit an angle of light of from 40 deg. to 50 deg., and a higher class of London-made articles claim, I understand, to embrace 60 deg. But, by a slightly increased expenditure of optical means, it is possible to increase this angle to 95 deg., which, I need scarcely observe, somewhat more than doubles the intensity of the illumination. Let us see in what way this is to be accomplished.

Kepler's law, as you all know, is that the focus of a plano-convex lens equals the diameter of the sphere of convexity. This is, of course, for parallel rays, and it is those we are dealing with at present; and we are also dealing with plano-convex lenses, these being the best for condensers, subject perhaps, to a slight hollowing of the flat surface, of which I shall soon speak. Well, it is very evident that if we desire a large angle of light, the single Kepler won't do much for us, unless, indeed, it was made enormously thick—even hemispherical—when we would encounter two evils; first, the enormous spherical aberration consequent upon transmitting light through a bull's-eye; and secondly, the proximity of the said bull's-eye to the radiant, which not only emits light but heat—a heat which would quickly cause our bull's-eye to see stars and stripes. How, then, is it to be accomplished? By borrowing the ideas of the microscopist. Did any of you ever hear of a microscopic objective of even the most distant pretensions to wide-angle being composed of one lens? Can you conceive of such a thing? Well, no more is it possible in our collecting system, which is analogous. We must have, at least, two lenses for our purpose. One of them—that nearest to the light—must be 4½in. in diameter in order to catch up the 95 deg. of which I spoke. But this cannot render the rays parallel; still *it* transmits them to its colleague under such circumstances that it does so, the two lenses thus doing what no one singly could effect.

The first lens of the collecting system is comparatively thin, which, apart from any optical advantage, is useful in this respect, that it has to bear the first impact of the heat; and, as you can readily understand, the lessens the liability to fracture. It is only sixteen m.m. (⅝ inch) thick in the centre, is eight to nine inches focus, and is formed by preference of flint glass. The second element is five inches in diameter, and the radius of curvature being rather shorter, this combined with its greater diameter, causes it to be proportionally thicker, being twenty-eight m.m. ($1\frac{1}{16}$ inch) at its centre, and seven inches focus. This lens, too, should be made of colourless glass. The loss of light from absorption is but little, and I anticipate an objection that might be suggested as to this from oblique incidence. This is really so little as to be unworthy of notice, but it carries with it its compensation; for it occurs most at the thinnest portions of the lens where there is the least absorption, and thus aids in ensuring uniformity of illumination throughout the entire beam. But it may be reduced by rendering the first surface concave instead of plane, and retaining the balance of power by grinding the back surface on a tool of shorter radius. I at one time was madly in love with the meniscus form of lens for this purpose, but incited there-there to by the experience of Dr. H. Morton, after many trials with lenses both plano and meniscus, and formed of different kinds of glass, from St. Gobain's crown to English flint, I arrived at the conclusion that the plane surface answered every purpose in an effective manner.

If the radiant were infinitesimally small, a parallel beam of a large collected angle could be transmitted with a singular degree of perfection for several yards. With a triple collecting system (that worked out by Dr. Charles Cresson, in which the first lens is a plano-convex 4½in. radius, the second a meniscus, respectively 30in. and 6in.; and the third a crossed lens of 52in. and 8¾in. radii) I projected across my bedroom a very tiny gaslight on to the dial of a French clock, which was thus illuminated a whole season. But such extreme nicety is not required in the practical working of the optical lantern, as, owing to the magnitude of the flame, two elements answer every purpose. The two that I have described should be mounted together as closely as possible, fixed permanently in the lantern, and must always be used together, and not separate. Until a compound collecting system of this nature is tried, one can form no idea of the capabilities of the lantern for certain scientific purposes, such as polarising.

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*Ex-Com. Camera Club.

Let us now direct our attention to the *condensing* element of this optical system. We have seen that the two elements of the collecting portion must be fixed and inseparable. This, on the contrary, should be variable, and selected to suit the special end in view. Its form may be plano-convex, more especially if for use with long-focus objectives; but if the latter is to be short-focus, and the condenser of crown glass, then is the crossed form, in which the curves are as one to six, or two to thirteen, open to be preferred.

But, dealing as we now are with immergent parallel rays, it were folly to imagine that a condenser properly adapted for an objective of 12in. focus will answer equally well for one of 6in. Bearing in mind Kepler's law, which, however, applies only to one kind of glass, and must not be held as applicable equally to the flint glasses, especially those of the denser sort procurable at the present day, I would say that for long projection lenses of 12in. to 15in. focus a plano-convex having a radius of curvature of 7in. will serve every purpose; for an objective of 8in. to 10in. the radius may be 4½in., while for one of 6in. to 8in., 4in. will suffice. But, as I have said, this latter may with advantage be a crossed lens, in which case the radius of the more convex side will be longer.

One word more before dismissing the condensers. Treat them with the most scrupulous care, both in heating and cooling, and avoid allowing a current of cold air to play upon them during the cooling. With this precaution, superadded to having them set loosely in their cells, a fracture will rarely, if ever, occur.

Turn we now to the objective—the image former. First its diameter, especially that of its posterior combination, must be sufficiently large to take in not merely the whole of the cone of rays emerging from the condenser, but by preference a little more. This permits of the utilisation of a small portion of light radiated from the substance of the image itself.

A large black lens also permits it to be brought nearer to the picture, and this is advantageous, especially with the condensers of the common order, as it acts in condensing the scattered rays from those of this class, enabling also the light to be approached nearer to the condenser. The lens tube should be longer than in the case of its application to photography, for, unlike this, all it is required to cover is the very limited area comprised in a plate three and a-quarter inches square, minus the portion occupied by the mat. For the highest class of objective, it suffices that it be achromatic in the sense different from actinic, for, so long as the visual image is perfect, it matters not what becomes of the violet or chemical rays, or what relation they have to the luminous ones.

It is in the construction of a lantern objective of short focus that the skill of the optician is taxed, as it has to cover sharply to the margin with its full aperture, and under circumstances in which the slightest inequality in the definition is instantly detected. To a cultivated eye it is extremely unpleasant to see an image quite sharp in the centre of the disc, and falling off rapidly towards the margin, or by racking in, securing marginal sharpness at the expense of the centre. Of the various forms of objective to be met with in commerce, at any rate for those of medium short focus, I incline to give preference to that introduced ten or eleven years ago by J. H. Dallmeyer, judging by the performance of one of this class in my possession, made by Newton and Co. In it the elements of the back lens are separated to an extent which would prove hostile to sharpness in the case of one employed in producing a photographic image in the camera. If photographic lenses are to be employed in the lantern, those of the *carte-de-visite* (Petzval form), that is those corrected for flatness of field, even to the extent of there being slight astigmatism, are advantageous. One of the most satisfactory *short* focus objectives I ever used had a back lens 2¼in. in diameter, the front lens being 1¾in. I gave a very great excess of negative spherical aberration to the back lens, and the front was a nearly plano-convex achromatic of short focus. This gave a field which was singularly flat, the definition at the margin quite equalling that in the centre; but owing to the excess of aberration spoken of, the image did not quite equal in sharpness that obtained by the ordinary *carte-de-visite* lens with rounder field. Still, spectators seated at a distance of five yards from the screen were unable readily to appreciate that the definition was imperfect, for, as you know, even the crude brush work of the scene-painter seems sharp when viewed from a distance.

In objectives of long focus there does not appear to be the same tax on the skill of the optician. Poor, indeed, must be the lens of 10in., 12in., or 14in. focus that will not cover sharply and uniformly a plate 3in. in. dimensions.

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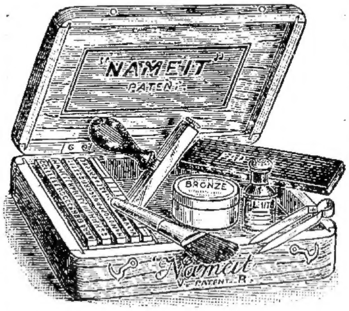
Editorial Table.

NAMEIT.—We have received from the patentee and manufacturer, Mr. A. Gray, 44, Snow-hill, E.C., an apparatus for producing names, descriptions, or numbers on photographs. The outfit is packed in a well-made polished box, and should be welcomed by all wishing to name their prints in a neat and uniform manner. The desired name is set up in the holder, with the rubber-faced type (and presents this style: 44, SNOW-HILL, LONDON,) and dabbed upon a pad containing a special ink termed "filmite." This is then pressed on a sheet of the medium supplied, which causes the name to be imprinted upon it. Bronze powder is then dusted over it to cause greater opacity. The film is then attached to the negative in the position selected, by touching either end of the strip of medium with a little vinegar, and the operation is complete. Each print taken from the negative will have the name in clear and distinct white letters.



DEAD BLACK.—A bottle of dead black sent by Messrs. Humphries & Co., 268, Upper-street, Islington, has enabled us to do a little touching-up on our lens mounts. We also find it very efficient for applying to wood, or stopping out lantern slides. A sixpenny bottle will cover several square feet.

STERN'S SINGLE AND STEREOSCOPIC CAMERA.—A hand-camera which can by one movement be transformed for single (¼ plate), or stereoscopic (3½ by 6¼), negatives should be a desirable instrument. We recently spent a portion of a day making negatives with this apparatus. The plates (12) are conveyed to the exposing plate by the well-known pliable reservoir,

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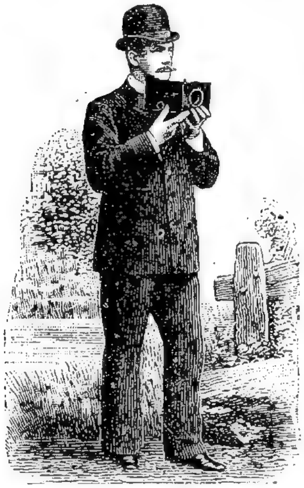


A PRACTICAL

HAND CAMERA

AND

A COMMON-SENSE WAY OF USING IT.

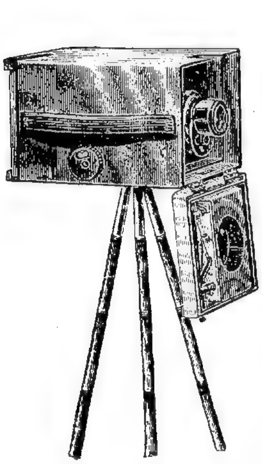
See Hand Camera Pamphlet (just published), 2 Stamps.

CAMERA WITH RACK AND PINION FOCUSSING, INDEX AND KERSHAW SHUTTER £2 15s. R R LENS, 35s. EXTRA. SIZE, SHAPE AND WEIGHT OF A BOX OF CIGARS.

It is admitted by all disinterested photographers of experience that I have produced the most practical Hand Camera ever offered. It is not a Magazine, and has, therefore, not the intricacy of a sewing machine, because such is not required. It is a straightforward, common-sense apparatus for a certain purpose, viz., "Snap Shot" Photography; and at the same time equally suitable for use as any ordinary camera for time exposures when mounted on a tripod, &c.

By not being a Magazine it has the merit of *simplicity*, and by being provided with Barnett's Patent Dark Slides (for which I am the sole agent in Europe) it has the virtue of *efficiency*, besides other advantages, such as portability, lightness, &c., &c. (and these are not all; you must read the pamphlet).

But just try and think of the scores of times a Hand Camera is required for perhaps two or three exposures only. With this Camera, two or three, four or five, or six plates may be carried in the pocket as little memoranda books, and we can sally forth with a perfect little instrument no bigger than a cigar box. But with a Magazine Camera we must trudge off with the whole affair, sometimes as big as a portmanteau, for the sake of one or two exposures, and to change the Plates we must set some machinery in motion, "turn this button first, push up this knob and release that spring," and adjust the whole so carefully, or it *won't go*, "hold it quite level, then turn the whole thing over," or fiddle about with a black bag, and so on, and so on. In fact, the whole thing is too ridiculous in the face of a simpler method.



My method of holding a Hand Camera—viz., under the chin—has, since it was first published in the *British Journal of Photography*, met with such approval, that there can be little doubt it will become universal. It was only *one* of the common-sense ideas connected with my Camera.

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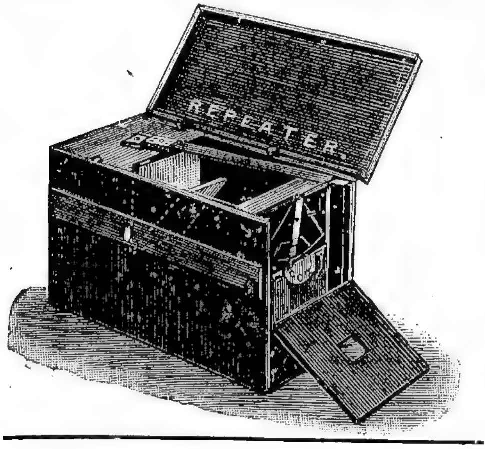

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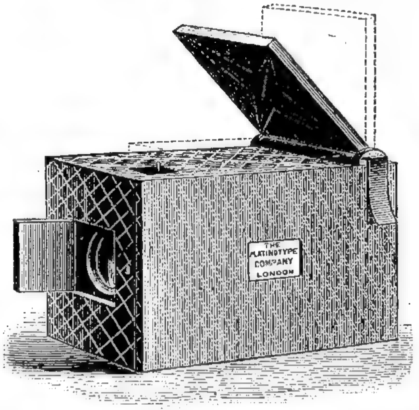

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and the exposures are made by a rotating shutter, which when wound up will give ten or twelve exposures, a slight depression of a trigger being sufficient. Time exposures may be given by moving the same trigger upwards, which causes the shutter to remain open, whilst a touch in the opposite direction causes it to close. The most ingenious part, however, is in the method of changing the camera for the two styles mentioned. A sliding movement of the front portion causes the stereoscopic partition to fold away, and opens out two small wings in the inside, which regulates the size for the single picture; this change can be effected instantly. We are informed by the wholesale firm (" Leviathan," London), that they anticipate a great run on this camera.

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Society Meetings.

BRECHIN PHOTOGRAPHIC ASSOCIATION. — On 15th ult., the secretary, Mr. J. D. Ross, read a short paper on " Stereoscopic Photography with a Quarter-plate Camera." Although not advocating the use of such a camera for the best stereoscopic work, he pointed out that a stereoscopic camera is not essential to the production of stereoscopic slides, and in proof exhibited a number of transparencies and other slides, taken with a small camera without extra top for stand or any extra apparatus.

CAMERA CLUB.—On April 30, Mr. J. Traill Taylor read a paper on "Lantern Optics." Mr. Lyonel Clark took the chair. (Particulars will be found on another page.) May 14 was a lantern evening at the Camera Club, and slides were shown by Messrs. D'Arcis, Pinkney, Fitz-Payne, Phipps, Lucas, Chang, Charters, White, Humphery, and other members. May 21, Dr. J. J. Ackworth read a paper on "The Flash Light." He, at the outset, dwelt upon the use made of the flash light on the continent for the production of artistic photographs, and exhibited a large number of examples of single figure and group studies. He described the appliances in use, and illustrated his remarks by showing specimens of lamps employed in Germany. The working of these was practically demonstrated, and some exposures were made by Mr. Chang.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.—The third ordinary meeting of the twenty-eighth session was held on April 30, Mr. Paul Lange (president), in the chair. The president exhibited Mr. Friese Greene's hand-camera, enabling as many as sixty consecutive photographs to be taken in one minute. Mr. John Price explained " Voightlander's " hand camera lens; also Ross and Company's universal symmetrical lens. Mr. J. A. Furnivel, of Manchester, gave a most interesting description of the optical lantern, explaining its various parts, jets, gas cylinders, &c., and after the lantern had been lighted up, proceeded to give some curious sound experiments, which represented the waves of sound of the human voice on the screen. Some beautiful microscopic slides were also shown, and the adaptability of the lantern to microscopic work explained.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (PHOTOGRAPHIC SECTION).—On May 1, Mr. J. A. Carter, M.A., in the chair, Mr. D. E. Goddard, F.R.M.S., read a paper on "Elementary Silver Printing." In an interesting way he set forth the whole routine of silver work, from sensitising one's own paper to the finished and mounted picture. On May 15, Mr. Edward Lovett, president, in the chair, Mr. J. A. Sinclair, of the Liverpool Amateur Photographic Association, gave an illustrated lecture, entitled " A Scamper Across Normandy with the Camera." The lecture was interspersed with highly interesting, curious, and laughable incidents that occurred during his travels. The fine interiors of the French cathedrals were particularly noticeable for their freedom from halation, and the whole series of pictures illustrating the lecture were of the highest technical excellence.

COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.—A general meeting was held May 6; resignation of hon. secretary, Mr. Harker. Mr. Thomas W. Owen, The Terrace, Earlsdon, Coventry, was appointed hon. sec.

HACKNEY PHOTOGRAPHIC SOCIETY.—The annual general meeting was held on May 14; Mr. Walter Wesson presided. The following gentlemen were elected for the ensuing twelve months: President, Dr. Roland Smith; vice-president, Dr. Ambrose Kibbler; Messrs. J. Herbert, Frank Jolly, and J. A. Sinclair (the latter gentleman was formerly of the Liverpool Society); Treasurer, T. O. Grant; curator, S. H. Barton; council, W. L. Barker, H. J. Beasley, Walter Wesson, A. Dean, F. Houghton, and C. F. Hodges. Mr. Fenton Jones, 6, Victoria-street, Hackney, was re-elected hon. sec. The report (third year) was a very satisfactory one.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—On May 11, Mr. G. W. Marchant in the chair, an interesting demonstration on the working of platinotype papers was given by a member.—A field day was organised for Saturday, the 23rd ult., to Hale End and district, when a fair number of the members attended. The party proceeded to Chingford old church, securing several very pretty bits on the way.—On May 25, a demonstration was given on the working of kallitype papers by Mr. F. W. Cox.

——:o:——

Correspondence.

MAGAZINE HAND-CAMERAS.

[*To the Editor.*]

SIR,—I am one of those who are interested in the magazine form of hand-cameras, and as I understand that "threatenings and slaughter" are being breathed against those who use them without a licence, I ask you for aid in the form of information as to the following. Am I at liberty to make a camera and reservoir, the plate from the latter being capable of being transferred to the focussing plane of the former, and removed therefrom without subjecting them to the action of light, and this by mechanical means operated from outside?—Yours truly,

W. S. BARNFIELD.

London, May, 1891.

[Cameras with reservoirs of the nature mentioned have been in use for over twenty years, and they have formed subjects for patents which have expired many years ago; therefore there can be no let or hindrance to the adoption of this system.—ED.]

EXCHANGE OF LANTERN SLIDES.

[*To the Editor.*]

SIR,—Although Mr. Doudney, in his letter in last issue, avoids mentioning names, I, having a large number of customers, may or may not be the party to whom he alludes. However, I, and in fact all those doing a large business, have at times been compelled apparently to disappoint those wishing to hire a particular set of slides for a given evening. During the busy season I have as many as twenty-four sets of the same slides required for use in one day, and it is not always possible to supply the particular set at such short notice as your correspondent evidently gave to the firms to whom he applied, and I think, when he considers the matter, he will not blame the tradesmen. I, and of course others too, are sometimes placed in an awkward position; thus, a set of slides is ordered by A, which is promised for a given time, I relying on B who will be using them first, to return them at stipulated time; but B does not do so, or possibly the railway company may not be prompt, and thus calculations are upset. The dealer has to bear the blame for all this, although the fault is not his.

Since I adopted the plan of sending all country orders well in advance, I have had very few mishaps; still, as I said, it is possible for them to occur.

Your correspondently evidently has not thought of the invested capital, experienced assistants required, and the breakage of slides (which in most cases the customers repudiate). When fine quality slides can be had on such moderate terms, few, I imagine, will care to run the risk of inferior amateur made slides. The proposed club would only be of use to those who already have large quantities of good slides and were able to give something in return for what they require. I fail to see the utility of this circulating club.—Yours, &c., WALTER TYLER.

Waterloo-road, S.E.

CARDIFF EXHIBITION.

[*To the Editor.*]

DEAR SIR,—We should like to explain the *raison d'être* of Class 15 at the forthcoming Cardiff Exhibition. Our object in offering an optical lantern for the best fifty slides of a town or district is merely an incentive to societies to form such collections, and although we stipulate that the winning slides shall become our property, they are intended to form a loan collection, to circulate amongst the British and American societies. Of course, with the present high standard of lantern slides, the whole of the work sent in should form most interesting collections, and, by arrangement with the competing societies, a valuable slide interchange should result, and here, we think, the utility of the scheme comes in. We trust, therefore, it will receive the cordial support of societies generally.—Yours truly,

G. H. BEDFORD, }
T. H. FAULKS, } Hon. Secs.

Cardiff, May 21, 1891

—:o:—

Notes and Queries.

W. Vicarey.—"I read an article by Mr. Andw. Pringle, in which he speaks of using lime-light with mixed jets, and goes on to say: 'I use oxygen from a cylinder, with Beard's regulator, and hydrogen from the house-main. This arrangement of itself necessitates a specially small nipple, and I see no element of danger in it, nor have I had any hitch in its management. This is so directly opposed to all that I have ever heard, that I should esteem it a favour if you would kindly give your opinion. I have always understood that it is a very dangerous thing to use a mixed jet thus. I am very glad you are taking up the question of the ether light. I for one should like to use it, but am deterred by fear of explosion, as it would be a very serious thing to bring an element of danger into a crowded schoolroom. I hope the question will be thoroughly thrashed out." *Reply.*—Mr. Pringle is a most experienced lanternist, and could ascertain by glancing at the light whether everything was working under safe conditions. We would not, however, like to recommend it, as lanternists of less experience might be led to employ it and obtain results of a totally different nature. If you do try it, be sure you use a regulator on the bottle.

R. G. writes: "Could some of your readers oblige occasionally by a few hints on painting photographic slides, either in water colours or oils? The lessons should be both short and simple. *Reply.*—We hope shortly to have a series of articles on the subject, by Mr. A. W. Scott.

Amateur states that he intends using mixed gases from bottles, and asks "(1) Shall I require a larger bottle for hydrogen than for oxygen? (2) In event of one regulator wearing out or bursting (which I should think always liable to occur) while jets are alight, pressure would be taken off; what would result? (3) Shall I require two gauges, or can one be used for both the oxygen and hydrogen bottles?" *Reply.*—(1) About 10ft. of oxygen to 12ft. of hydrogen. (2) If the oxygen pressure were thus released the hydrogen would continue to burn at the jet; if the other, the light would go out. You will find a descriptive article on regulators in this issue. (3) Yes, a separate gauge for each. We lately heard of a serious explosion, caused by employing the same gauge for both gases.

H. S.—We may be able to give a sketch as requested; the communication will, we hope, appear in next issue.

Jas. D. Ross.—Glad it is so much appreciated. Number was sent.

Robt. Simpson asks: If a gauge is attached to a gas bottle of 12ft. capacity, and it registers 1,800, showing it is fully charged, should the gauge show 1,500 or 900, when half empty?—*Answer.* 900.

M. B. writes: "Will you kindly say in "Notes and Queries," whether Messrs. Perken, Son and Rayment's dissolving tap is better than that of Messrs. Noakes and Son. If you let me know the cost of reply to this query I will send the amount. *Reply.*—We cannot institute comparisons between the goods of different manufacturers. Both are makers of repute, and would not produce articles which would reflect discredit. We make no charge for answers in this column.

Screen says: "I am having a screen made, and intended making a frame according to the instructions given in January issue, by Mr. Hilton Grundy, but instead of the broom-handles I wish to use bamboo cane. Can you oblige by telling me where I can get this latter, and the price for a 12ft. screen?" *Reply.*—There is a shop in the same street as your address (Queen Victoria-street), near St. Paul's Station, where bamboo can be obtained in a variety of thicknesses and lengths. We have no idea of the price.

C. B.—Perhaps you can manage to reduce the drawing with a pentagraph.

Camera.—Your informant is quite right. The picture would have been greatly improved had you placed the camera just off the side of the road instead of in the middle of it; try one from the side and observe the improvement.

Perfect.—Lantern size cover glasses with clouds can be obtained from almost any photographic dealer.

C. G. Norton.—Your jet is at our office: you forgot to send for it.

Cook, Shaw, & Co.—The piece of *Papier Vermeil* you sent was too small to ascertain its merits.

Ch. E. Gladstone.—Particulars of lantern slide exchange with America crowded out for this issue; will make a note of it in next.

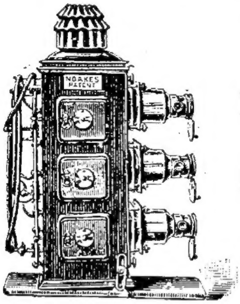
T. H. S.—In next issue; came too late for this.

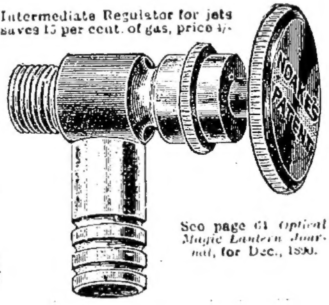
H. B. asks:—"Would there be any likelihood of an explosion if a lighted match were held at an oxygen cylinder, the tap being turned on part way, or is there any danger in this?" *Answer.*—It would make the match burn brighter; no danger.

H. V. T.—If you tilt the top of the screen so as to bring it at a right angle with the lantern, you will not be under the necessity of placing the lantern on a series of empty boxes as you suggest. Tip the lantern backward, until the disc is in the place required, and then adjust the screen.

A. W. S.—Thanks, but it came rather too late for this issue.

[An interesting reply *re* "Ether Saturators," by Mr. Norton, came just as we were going to press, and will appear in next issue.—ED.]





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See page 61 *Optical Magic Lantern Journal*, for Dec., 1890.

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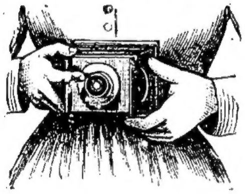

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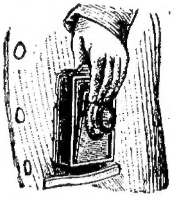

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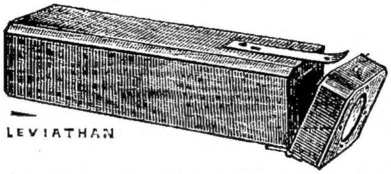

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